



CAMOSUN COLLEGE
School Of Trades and Technology
Department of Civil Engineering Technology
Cive 262 – Soils and Materials 2
2020 Winter

COURSE OUTLINE

Ω Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.

1. Instructor Information

Instructor	Bao-Qin Bai	
Office hours	As Posted	
Location	Tech 114	
Phone	250-370-4442	Alternative: _____
E-mail	bai@camosun.bc.ca	
Website	http://civil.camosun.bc.ca/student/	

2. Prerequisites

C in CIVE 261

3. Short Description

Students are introduced to the theory and application of soils settlement calculation and shear strength, and the design methods of retaining walls and foundations, and the analysis of slope stabilities. Students learn the basic concepts and principles of the construction materials of aggregates, Portland cement concrete, asphalt binders, and mixes, including the design, batching, and testing of Portland cement concrete and the design and testing of asphalt mixes. Typical standard tests on soils, aggregate, Portland cement concrete, and asphalt mixes are performed.

4. Intended Learning Outcomes

(If any changes are made to this part, then the Approved Course Description must also be changed and sent through the approval process.)

Upon successful completion of this course a student will be able to:

- Apply relevant safety regulations and best practices in the lab and in the field.
- Conduct a one-dimensional consolidation test and a direct shear test and analyze the test results.
- Calculate settlement due to primary consolidation.
- Describe how to use soil properties to evaluate a slope stability and to design foundations and retaining walls.
- Sample aggregates in normal field settings (i.e. pits, truckloads, conical piles, etc.).
- Describe the general process of aggregate production and appropriate methods of stockpiling and handling.
- Explain the concepts and testing methods of aggregate cleanliness, toughness, and durability.
- List and describe the principal composition of the raw materials used in the production of the five major types of Portland cement.

- Describe the characteristics of the main compounds, the physical properties and tests of Portland cement.
- Describe the requirements for the major component materials and typical admixtures in Portland cement concrete.
- Describe the differences between entrained and entrapped air in Portland cement concrete.
- Design Portland cement concrete mix using the absolute volume method.
- Describe the concepts of deformation and durability of hardened Portland cement concrete.
- Describe classification, production, composition, and their basic properties of asphalt binders and asphalt mixes.
- Design asphalt mixes according to Marshall method.
- Describe how the basic asphalt mix properties influence the behaviors of asphalt pavement.
- Grade asphalt binders using the Canadian General Standards Board and the Superpave grading systems; describe the basic testing methods used in the gradings.
- Test the properties and analyze their test results for aggregate, plastic and hardened Portland cement concrete, and asphalt mix.

5. Required Materials

A pair of steel-toed boots that are needed for labs and field trips

6. Course Content and Schedule

(Can include: Class hours, Lab hours, Out of Class Requirements and/or Dates for quizzes, exams, lecture, labs, seminars, practicums, etc.)

This Course Content is subject to change without further notification.

Week	Soil Mechanics	Materials	a) Lab	
1	* Review Cive 261 * Settlement	* Aggregate	1. One-D Consolidation Test	
2				
3		* Portland cement		
4	Quiz 1	* Portland cement concrete	3. Coarse Aggregate Tests	
5			4. Coarse and Fine Aggregate Tests	
6	* Soil shear strength		2. Direct Shear Test	
8	Quiz 2;		5. Concrete Batching and Testing	
9	* Retaining Wall		* Asphalt binder	6. Comp strength test (7d)
10	* Slope Stability		* Asphalt mix	6. Comp strength test (14d); Field trip
11	Quiz 3;	7. Marshall specimens		
12	* Shallow Foundation	7. Marshall test; 6. Strength test (28d)		
13	* Deep Foundation	Introduction to Asphalt Binder PG system	Field trip	
14	Quiz 4		* Review	

Hours and Credits:

Course Activity

- Lecture (Direct Instruction)**
- Seminar (Direct Instruction)**
- Lab /Collaborative Learning**
- Supervised Field Practice**
- Workplace Integrated Learning** (Coop, Internship, etc.)
- Other***(please note):

Hours / Week	Instruction – No of Weeks (Q=11; S=14; "P or S" = 7)
5	14
3	14

Credits = 4

7. Basis of Student Assessment

(Should be directly linked to learning outcomes.)

Component	Weighting	Comments
Quizzes	21%	Written, closed book with review sheets*
Labs	21%	
Field trips	3%	To a concrete batch plant and an asphalt mix plant
Instructors Assessment	5%	
Final Examination	50%	Written, closed book with review sheets*
TOTAL	100%	

8. Grading System

(If any changes are made to this part, then the Approved Course description must also be changed and sent through the approval process.)

(Mark with "X" in box below to show appropriate approved grading system – see last page of this template.)

Standard Grading System (GPA)

Competency Based Grading System

9. Recommended Materials to Assist Students to Succeed Throughout the Course

- (a) **References:** * D.F. McCarthy, Essentials of Soil Mechanics and Foundations, Prentice Hall
 * M. Budhu, Soil Mechanics and Foundations, John Wiley & Sons, Inc.
 * Engineering Properties of Soils and Their Measurement, J.E. Bowles, McGraw-Hill Book Company.

10. College Supports, Services and Policies



Immediate, Urgent, or Emergency Support

If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @ <http://camosun.ca/about/mental-health/emergency.html> or <http://camosun.ca/services/sexual-violence/get-support.html#urgent>

College Services

Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at <http://camosun.ca/>

College Policies

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at <http://camosun.ca/about/policies/>. Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment, Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines.

A. GRADING SYSTEMS <http://camosun.ca/about/policies/index.html>

The following two grading systems are used at Camosun College:

1. Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D		1
0-49	F	Minimum level has not been achieved.	0

2. Competency Based Grading System (Non GPA)

This grading system is based on satisfactory acquisition of defined skills or successful completion of the course learning outcomes

Grade	Description
COM	The student has met the goals, criteria, or competencies established for this course, practicum or field placement.
DST	The student has met and exceeded, above and beyond expectation, the goals, criteria, or competencies established for this course, practicum or field placement.
NC	The student has not met the goals, criteria or competencies established for this course, practicum or field placement.

B. Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy at <http://camosun.ca/about/policies/index.html> for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	<i>Incomplete:</i> A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	<i>In progress:</i> A temporary grade assigned for courses that are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
CW	<i>Compulsory Withdrawal:</i> A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.